

20 W High Efficiency 1550 nm Pulsed Fiber Laser, Phase I

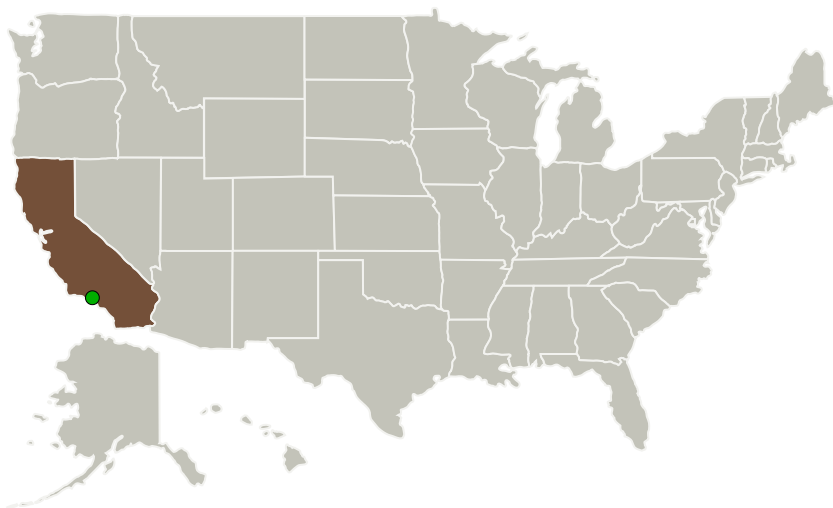
Completed Technology Project (2014 - 2014)



Project Introduction

High peak power short pulsed lasers have been considered to be an enabling technology to build high power transmitters for future deep space high rate space communications. However, to achieve a high peak power at a high repetition rate over 100 MHz and with a short pulse width and >25% wall plug efficiency still remains an issue unsolved. PolarOnyx proposes a novel approach targeting to make 10 MHz to over 100 MHz high repetition rate high power fiber laser at 1550 nm and resolve the issues of modulation induced chirp, pulse distortion and nonlinear effects by using COTS components and employing our proprietary technologies in specialty fibers, spectral shaping and pulse shaping techniques. Space qualification will also be addressed in laying out the pathway towards space deployment. A tabletop demonstration will be carried out at the end of Phase 1. A prototype will be delivered at the end of Phase II.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Polaronyx, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	San Jose, California
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

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Primary U.S. Work Locations

California

Project Transitions



June 2014: Project Start



December 2014: Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140562>)

Images



Briefing Chart

20 W High Efficiency 1550 nm
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(<https://techport.nasa.gov/image/126813>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

PolarOnyx, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Jian Liu

Co-Investigator:

Jian Liu

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Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
 - └ TX05.1 Optical Communications
 - └ TX05.1.3 Lasers

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System